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Forage News [2005-05]

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FORAGE NEWS

For more forage information, visit our UK Forage Extension Website at: **http://www.uky.edu/Ag/Forage**

MAY 2005

Garry D. Lacefield and S. Ray Smith, Extension Forage Specialists ● Christi Forsythe, Secretary

SPRING GRAZING SCHOOL

The Kentucky Spring Grazing School was held at the Morehead State University Farm on April 20-21. The weather was "PERFECT", food delicious and a good time was had by all. Special THANKS to Rowan County Extension Agent Bob Marsh and Eddie Lundergan, Morehead State University Farm Manager, along with faculty, staff and students at MSU for hosting the school. Tentative plans call for the Fall Grazing School to be in Lexington in late October. More details on dates and specific location in next month's Forage News.

KFGC OFFICERS

The Kentucky Forage & Grassland Council officers for 2005 are:

President – Dan Grigson
Vice President – Phil Howell
Secretary – Ray Smith
Treasurer – Byron Sleugh

We express special thanks to Phil Howell for serving as treasurer over the past four years. We welcome him to the Executive Committee in a new role as Vice President. We welcome Ray Smith as our new secretary and Byron Sleugh as our new treasurer.

PRODUCTIVITY OF SIMPLE AND COMPLEX MIXTURES OF FORAGES COMPARED IN ON-FARM PASTURES

There are few studies that have taken a practical approach to examining how well complex forage mixtures persist in intensively managed pastures. We conducted an on-farm study to compare changes in botanical composition and yield of simple and complex forage mixtures under grazing. Three forage mixtures (2, 3, or 11-species or grasses, legumes, and a forb) were established in replicated 1-ac pastures on a farm in eastern Pennsylvania and grazed by dairy heifers or managed under a 3-cut hay system for four years. Our results suggest that planting a complex mixture of forages without regard to the identity of the species in the mixture is not wise. Less than half of the species planted in the 11-species mixture persisted during the entire 6-year experiment. The complex mixture yielded more forage dry matter than the 2-species mixture, but this difference was due to the inclusion of a few highly productive forage species (e.g., chicory and alfalfa). Producers should first determine what forage species are best adapted for their situation, and then consider whether a complex mixture of forages is necessary or if separate plantings of different species across the farm would be more useful. *(SOURCE: Matt A. Sanderson, R. Howard Skinner, and Benjamin F. Tracy, Forage Progress, Vol. 3, March 2005)*

– AFGC –

LAST CHANCE FOR THE NATIONAL FORAGE CONFERENCE IN 2005

In just a little over a month the AFGC conference will be held in Bloomington, Illinois (June 11 – 15). This will be the most comprehensive forage conference of 2005. Full details are on the AFGC website www.afgc.org. Consider attending this conference. In fact, KFGC and UK are sponsoring a van to the conference. Contact Ray Smith if you are interested in riding with us in the van (raysmith1@uky.edu).

SUMMARY OF GOOD HAY-MAKING PRACTICES

Practices	Reasons	Benefits
Mow early in the day.	Allow a full day's drying.	Faster drop in moisture. Less respiration loss. Less likelihood of rain damage. Higher quantity and quality.
Form into spread swath.	Increase drying rate.	Faster drop in moisture. Less respiration loss. Less likelihood of rain damage. Higher quantity and quality.
Rake or ted at 40% to 50% moisture content	Increase drying rate.	Faster drop in moisture. Less respiration loss. Less likelihood of rain damage. Less leaf shatter. Higher quantity and quality.
Bale at 18% to 20% moisture.	Optimize preservation.	Less leaf shatter. Inhibition of molds and browning. Low chance of fire. Higher quantity and quality.
Store hay under cover.	Protect from rain and sun.	Inhibition of molds and browning. Less loss from rain damage. Higher quantity and quality.

SOURCE: Pitt, R.E., 1991.

Losses from Alfalfa During Harvest Operations

Operation	Percent of DM lost	Percent of leaves lost
Mowing	1	2
Mowing/conditioning	2-4	3-5
Raking (70%-20% moisture)	2-12	2-21
Tedding (70%-20%)	1-11	2-21
Baling, pickup and chamber	3-6	4-8
Baling at 18%	5-13	8-21
Stack wagon	15	24
Total	7-31	12-50

SOURCE: Hundloft (1965), Kjelgaard (1979), Rotz (1989). Taken from Pott, R.E., 1990.

Changes in Alfalfa Quality with Rain Damage

Condition	CP	DDM	NDF	RFV	DM
	------ % of dry wt ------			Index	ton/ac
Standing Crop	23	66	43	143	2.0
Hay: no rain damage	20	60	46	121	1.7
Hay: rain damage	20	53	54	91	1.5

SOURCE: Dr. Mike Collins

Alfalfa Reduces Energy Needs for Food Production

Alfalfa is able to 'fix' nitrogen from the air so that nitrogen is available for plant growth and does not need nitrogen fertilizer. Nitrogen fertilizer is manufactured from fossil fuel, especially natural gas. About 33.5 million BTUs from natural gas are required to produce 1 ton of nitrogen fertilizer (anhydrous ammonia). Alfalfa also contributes nitrogen to subsequent crops (e.g. wheat, corn). Assuming that about 4.8 million acres of alfalfa are rotated to another crop each year in the US, and using a conservative nitrogen credit of 100 lb/acre to the subsequent crop, 292,000 tons of anhydrous ammonia equivalent are saved each year. This equals over 8 trillion BTUs of fossil fuel energy from natural gas. In addition, there are energy cost for transportation, application and inefficiency in plant uptake of fertilizer. *(SOURCE: National Alfalfa Alliance)*

Does Fertilizer Harm Soil Microbes?

Microbes in the soil are important to the nourishment of plants. Many of them facilitate the chemical conversions and physical transport needed to make nutrients available.

Some people claim that soil microbes should supply all the nutrients needed by plants. Some also claim that applying soluble forms of plant nutrients harms the biology in the soil and reduces its capacity to make the native soil nutrients available. Let's look at the evidence.

The microbes that supply nitrogen are from two categories – symbiotic and free-living.

The symbiotic types are mainly rhizobial bacteria that infect the roots of legumes, such as alfalfa and soybeans. These bacteria supply the bulk of the nitrogen needs of legumes. However, even genetic engineering has not yet been able to coax the non-legume crops – corn, wheat, canola, potatoes, and many others – to fix nitrogen. Most crops depend on nitrogen applications in the form of fertilizer, manure, or organic materials.

The free-living bacteria in the soil supply some nitrogen as well, but the amounts are limited and are not influenced by fertilizer. A paper published in the journal *Nature* in 1998 compared nutrient dynamics in three Pennsylvania crop rotations: one fertilized, one manured, and one legume-based. The study found that the free-living bacteria supplied less than 5 pounds per acre per year, an amount that did not differ between the three rotations. No evidence of harm.

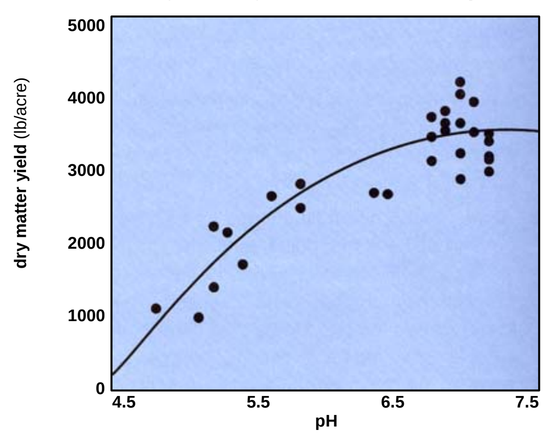
Microbes that help supply phosphorus form an association with plant roots. The association is called "mycorrhizae", a term that means "fungus-root". Fungi explore the soil better than roots, because their hyphae are narrower. They can bring phosphorus to the root from as far as 4 inches away.

Mycorrhizal fungi depend on the plant for energy in the form of sugar. It is well known that they are more active when phosphorus is deficient. But sugar used to feed the mycorrhizae yielded 14% less than when fertilized with phosphorus. The fertilizer – even though it was applied at twice the recommended rate – reduced the density of fungal hyphae by 24%, but certainly did not eliminate it. When soil test levels are low, phosphorus additions can actually increase mycorrhizal development.

Scientists have recently discovered that mycorrhizae produce a unique substance called glomalin. It may form as much as 30% of the organic matter in soil, and it seems to help maintain soil structure. Dr. Sara Wright, a noted expert on glomalin, recently stated that the best field-scale management for the production of glomalin is to "use minimal disturbance, add no more phosphorus than is required for crop production, and use cover crops." Soil microbes depend on plants for their nourishment. Fertilizers that nourish plants also nourish the biology of the soil. *(SOURCE: PPI Agri-Briefs, Spring 2004)*

pH Makes a Difference!

First-cutting alfalfa yield relative to soil pH.



Source: Wollenhaupt and Undersander, University of Wisconsin

UPCOMING EVENTS

JUN 11-15	American Forage & Grassland Conference, Bloomington, IL
JUN 16	Eden Shale Field Day, Owenton
JUN 26-JUL1	20th International Grassland Congress, Dublin, Ireland
JUL 28	UK All Commodity Field Day, Princeton
<u>2006</u>	
JAN 25-26	Heart of America Grazing Conference, Cave City Convention Center
FEB 23	26th Kentucky Alfalfa Conference, Lexington

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May 2005